

Keithsburg Bridge
(Wycoff Bridge)
(Watts Bridge)
16th Street spanning Pope Creek
Keithsburg
Mercer County
Illinois

HAER No. IL-34

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PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

Historic American Engineering Record
National Park Service
Rocky Mountain Regional Office
Department of the Interior
P.O. Box 25287
Denver, Colorado 80225

HISTORIC AMERICAN ENGINEERING RECORD
KEITHSBURG BRIDGE
(WYCOFF BRIDGE OR WATTS BRIDGE)

I. INTRODUCTION

Location: Mercer County Route 131
16th Street spanning Pope Creek
Keithsburg, Illinois

Quad: Keithsburg
Latitude 41° 6.6'; Longitude 90° 55.7'

Identification: Illinois Structure No. 066-6001
Section 85-05113-00-BR
Keithsburg Road District
SW 1/4 of NE 1/4 of Sec. 23, T 13 N, R 5 W.

Date of Construction: Circa 1870s
Rehabilitated 1884, 1914.

Present Owner: Keithsburg Township

Present Use: The bridge was closed in 1982.
Projected date of replacement is 1989.

Significance: This single span is one of seven remaining bowstring arch
bridges on the Illinois Inventory. The date of
construction and builder are not confirmed.

Historian: John B. Nolan, S.E., December 1988.

II. LOCAL AND BRIDGE HISTORY

The Keithsburg Bridge, which is the subject of this report, carries 16th Street over Pope Creek near the northeast corner of Keithsburg. The bridge is presently identified in county records as the Watts Bridge but was known earlier as the Wycoff Bridge.

Keithsburg is located in Western Illinois, Mercer County, on the east bank of the Mississippi River at the mouth of Pope Creek. The area's first permanent settler was Robert Keith, who arrived in 1837, sold town lots and established a wood yard to supply river steamboats. First named Keith's Landing, the town grew slowly, the few businesses struggling to survive. Growth accelerated in 1847 when the Mercer County seat was located here, but the boom faltered when the county seat was moved to Aledo ten years later. The last of three railroads which once served the community was removed in 1973.¹

Early records of the Commissioner's Court beginning with the March term in 1845 include numerous accounts of the building and repair of bridges in the county. There are two bridges spanning Pope Creek at Keithsburg, and early accounts often fail to show a distinction between the Wycoff Bridge to the east, and the New Boston Road Bridge to the west.

Early landowners near the Wycoff Bridge site were samuel Cabeen and Abram Sheriff, who are also mentioned as laborers at the sawmill. In 1837 William Sheriff set up a sawmill in the vicinity of the future bridge location. The mill probably supplied bridge timbers. Subsequent records include payments to Thomas B. Cabeen (son of Samuel Cabeen) and Abram B. Sheriff for repairing bridges.²

The Commissioner's Court record of September 1844 mentions several bridges under contract, including one over Pope Creek near Samuel Cabeen's residence. This bridge was completed in December by Jesse Brewer, a Keithsburg resident, who was paid \$164. At the same court George Jay Jr., was allowed \$1.50 for "viewing" (i.e., inspecting) the completed bridge.³

The life of untreated timber bridges was often of brief duration. Entries for 1845, typical of the period, note that T. B. Cabeen supplied timbers and repaired bridges in the county.⁴

¹History of Mercer and Henderson Counties (1882), pg. 119, 129.

²Ibid., pg. 129. Mercer County Commissioner's Court Records: September Term 1844, p. 130; December Term 1844, pp. 137-8; March Term 1845, p. 142; June Term 1849, p. 282; September Term 1849, p. 290.

³Mercer County Commissioner's Court Records: September Term 1844, p. 130.

⁴Ibid., March Term 1845, p. 142.

A June 1849 entry in Court records notes that Abram Sheriff was paid \$20 for furnishing rope and labor the taking out bridge timbers of the Pope Creek Bridge near Keithsburg. The following September Sheriff was paid \$84.90 for rebuilding the bridge.⁵

Unfortunately, there are gaps in county and town records between 1849 and 1912, the period when the Keithsburg Bridge was built.⁶ Upper Keithsburg, an addition north of Pope Creek, was annexed to Keithsburg prior to publication of the 1861 delinquent tax list.⁷ It is generally assumed that the present iron bowstring arch bridge was built by the Town of Keithsburg after the annexation.⁸ Design and fabrication details of the present bridge indicate a construction date in the 1870s.

The first specific mention of a Wycoff iron bridge is included in reports printed in The Keithsburg News:

March 31, 1881

The iron bridge northeast of town, on the Wycoff Road, was somewhat jeopardized last week by one of the banks giving way.

June 16, 1881

The flood came again Sunday and Sunday night and Monday Pope Creek was raging, sweeping away fences, bridges and debris...The Wycoff Bridge is left standing alone in the middle of Pope Creek. The approaches on either side washed away Monday.

It appears that the Keithsburg Bridge, then known as the Wycoff Bridge, received structural damage in the 1881 floods. Although a direct mention has not been found, the amount of expenditure in 1884 is evidence that the bridge was renovated, not replaced.⁹

⁵Ibid., June Term 1849, p. 282; September Term 1849, p. 290.

⁶Mercer County Highway Superintendent, Martin Herman has unsuccessfully searched the Board of Supervisor's records; City Clerk, Sharon Reason has unsuccessfully searched city records and other local sources. Microfilmed Keithsburg and Aledo newspapers have also been searched in the Illinois State Historical Library.

⁷Aledo Weekly Record. May 14, 1861.

⁸Statement by Sharon Reason.

⁹The Keithsburg Times. April 22, 1885.

The published Highway Treasurer's Report for the Town of Keithsburg includes the following expenditures for the Fiscal Year ending March 25, 1885.

303	Mt. Vernon Bridge Company	\$1,637.33
187	Keithsburg Lumber Company, lumber for Wycoff and other bridges.	132.35
184	Samuel Burris, labor on Wycoff Bridge	20.00
345	B. O. Hardin, damages assessed by Supervisors for Wycoff Road	218.73
193	J. P. Wycoff, work on road and bridges	50.00
	Leaving a balance to date of	\$ 138.51

Commissioners have out one order of \$210.00.
When the delinquent tax comes in we will be out
of debt and feel happy.

Josh Willets, Treasurer

County histories identify Captain J. P. Wycoff, a Union Army veteran, as the owner of city lots and a farm about one mile north of the bridge. He was an influential citizen involved with several enterprises and railroad promotion.¹⁰

The Keithsburg City Minutes of January 5, 1914, note that the Keithsburg Bridge, then known as the Wycoff Bridge, was again in bad shape and would be closed temporarily.¹¹ Site location and future entries indicate that foundation problems were a continuing concern.

On October 6, 1914, the Decatur Bridge Company, which had constructed the nearby New Boston Road Bridge in 1912, received instructions for replacing the bridge abutments.¹²

"Oak piling to be used in Wycoff Bridge instead of steel."
"Steel backing and steel wings to be used at north sides."

The October 22, 1914 entry states:

Decatur Bridge Company	\$494.00
all steel delivered	
Hauling and erection	
of all steel work	
and driving piling	
& filling tubes w/ concrete for	\$490.00
Raising, moving and adjusting	
old bridge.	\$ 40.00

¹⁰History of Mercer and Henderson County, (1882), p. 193.

¹¹Keithsburg City Minutes, January 5, 1914, p. 290.

¹²Ibid., October 6, 1914, p. 308.

The bridge work was reported complete on April 5, 1915.¹³

Due to an S-bend at the bridge location, Pope Creek has continued to erode the north bank while adding twenty feet of silt to the south side. At a later, indeterminate date, possibly in the 1950s, the continuing southerly tilt of the north tubes necessitated a relocation of the bridge's south bearings from the original tube supports to new concrete footings 3'6" south of the 1914 positions. Surprisingly, no evidence of past or present compressive distress in the bridge is noticeable.

Still standing, the bridge is presently known as the Watts Bridge, and was renamed for Bob Watts who is now elderly and lives nearby on the north side of Pope Creek. After the decline of residents north of Pope Creek the annexation of North Keithsburg was dissolved at Mr. Watt's request on February 8, 1980.¹⁴

The Keithsburg Bridge continued to carry local traffic, including mail and school bus routes, until it was closed in 1982 due to deteriorated deck planking and possible structural deficiencies.

III. THE BRIDGE

A. The Bridge Type

The Keithsburg Bridge type is a bowstring arch, sometimes called a "Rainbow Bridge".

The first metal bowstring arch was patented in 1841 by Squire Whipple of Utica, New York. Whipple combined an arch ring of cast iron with a wrought iron tension chord. The addition of tension ties overcame the need for large gravity end supports which would otherwise be needed to resist the arch thrust. Vertical and diagonal rods stiffened the system.

By the 1870s the cast and wrought iron components were replaced with steel members when that material became available and economical. Numerous variations of the bowstring arch were patented and built by independent bridge companies. Although too light for railroad work, this type was economical and continued to be popular for wagon road spans of less than 80' into the 1880s.¹⁵

The arch of Keithsburg Bridge is fabricated from four bent plates riveted to form an approximate 8" square cross-section (Fig. 1). This arch fabrication is unique among seven bowstring arches in the Illinois Inventory. No similar arch assemblies have been noted in pictorial records published by other states.

¹³Ibid., April 5, 1915, p. 316.

¹⁴Statement by Sharon Reason.

¹⁵Plowden, p. 61.

Diagonal planking of the subfloor is skewed 30° and supported on the transverse floor beams.

B. Fabricators and Builders

The Mount Vernon Bridge Company

Although the original date and builders of the Keithsburg Bridge cannot be verified, it is presumed that the Mt. Vernon Bridge company of Mt. Vernon, Ohio, which rehabilitated the structure in 1884, erected the original bridge.¹⁶

Some records place the beginning of the Mt. Vernon Bridge Works in 1871. However, the organization was not formalized until 1880 under the leadership of John S. Braddock, local real estate man and first president, and John Ewalt, of the First National Bank, as the Secretary-Treasurer. No engineer is named in early records.¹⁷

The original company specialized in bridges for rural roads (some of which were still in use in Knox County, Ohio in 1976) and also some work for the Pennsylvania Railroad. The work force consisted of about thirty men, and when a bridge was to be loaded on railroad cars by hand, the office force and lone draftsman were called upon to assist. Traffic was blocked on the street outside the small plant as the steel was maneuvered to the railroad.¹⁸

Financial disaster forced the plant to close in 1894, but it was re-opened in 1898 and, with competent management, built a number of major and award winning bridges into the early 1950s. Retirements in the management and changes in ownership resulted in decline and final closure in the 1960s.¹⁹

No other extant structures in Illinois are known to have been built by the Mt. Vernon Bridge Company.²⁰

The Decatur Bridge Company

The Decatur Bridge Company of Decatur, Illinois, rebuilt the abutments and repositioned the Keithsburg Bridge in 1914. The Decatur Bridge Company operated

¹⁶F. W. Feters reports that the Knox County (Ohio) Historical Society is searching for the Mt. Vernon Bridge Company records.

¹⁷History of Knox County, Ohio, pp. 172-3. Telephone conversations with Mary McGavick, R. W. Feters and Barbara Henritz.

¹⁸Ibid.

¹⁹Ibid.

²⁰Jerald a. Merrick, Head of Reference Department, Decatur (Illinois) Public library.

under that name from 1902 until 1922, when it was absorbed by the Mississippi Valley Structural Steel Company, which was subsequently bought by Bristol Iron and Steel Company and closed in the 1970s.²¹

Two other structures on the Illinois Inventory are known to have been fabricated by the Decatur Bridge company. One is the 141' thru Pratt truss built in 1914 near Charleston. The other is a three-span, pony lattice variation, which is 60' total length, and is located in Woodland Cemetery, Clinton, construction date is unknown.²²

C. Dimensions and Members

Structure length, center to center bearings, 65'-4".

Roadway width 15'-10".

Two parabolic arches fabricated with four 1/8" "stretch W" shaped plates, forming an 8" x 8" box, 1/2" rivets at 6" to 9" random spacing (Fig. 1).

Center to center of arch chords = 16'-6".

Height of arch at bridge center line (U4L4) = 6'-4 1/4".

Height of arch at U2 and U6 = 4'-2 1/2".

Height of arch at U1 and U7 = 2'-7 1/2".

Lower chord, 2 eyebars 5" x 1/2", separated 1/2", 2 panels in length.

Lower ends of verticals and diagonals are looped or flattened and pinned between the lower chord bars.

Eight panels, variable spacing 7'-8" to 9'-2".

Verticals at panel points:

U1-L1, U7-L7: 1 1/4" rods, upper end threaded, cast iron bevel washer on top of arch.

U3-L3, U5-L5: Triangular brace frames, Ls 1 1/2" x 1 1/2" x 1/4" with 1'-7" base on extended floor beams; 1 1/4" x 3/16" lacing.

Others: Cruciform rods, 1 1/4", upper end threaded.

Diagonals, "X" stiffening all panels, 3/4" rods, upper ends threaded, cast iron bevel washer on top of arch.

Lateral bracing, 9/16" rods, connecting L0-L3-L5-L8.

Floor beams, B 13: 7" x 3 5/8" x 12.5 lbs/ft. supported on and bolted through lower chords; attached timber nailers, 4" x 4"; 2'-6" spacing.

Deck: Lower, diagonal timber planking, 3" x 12" @ 30°.

Upper, longitudinal timber planking, full width, 3" x 12".

Bearings: Cast anchor bolsters and male shoes at end of arches, 2" pins.

Abutments: Steel plate tubes, 1/4" x 3'-0" diameter, filled with concrete, steel top plate. North abutment tubes are tilted toward stream about 4'.

Bearings have been moved northerly in tube top. North abutment backing and wings, 1/2" plate, tilted and bowed at center an additional 2'. South abutment backing and wings - 1/4" plate, silted to top.

²¹Ibid.

²²Illinois Historic Bridge Inventory, IDOT, 1983.

IV. OWNERSHIP AND FUTURE

The Keithsburg Bridge is presently owned and maintained by Keithsburg Township. The bridge has been closed since 1982 due to structural deficiencies, deteriorated floor, critical abutment displacement, and narrow roadway. The Township has been bearing the potential liability since that time.

Plans have been prepared for the replacement of the bridge, but construction scheduling has been deferred until funding can be secured.

Replacement of the present closed structure is a high need project as the roadway in the past served as a mail and school bus route. Projected traffic is estimated at 250 ADT with the majority of use being for local access to the City of Keithsburg and farm related commerce. Alternate travel is approximately five miles.²³

The Keithsburg bowstring arch bridge is one of the few remaining examples of this type of early metal bridge development. The projected relocation will assure the preservation of this relic of American structural heritage.

²³Interview with Mr. George Carpenter.

VI. REFERENCES

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Interviews and Conversations

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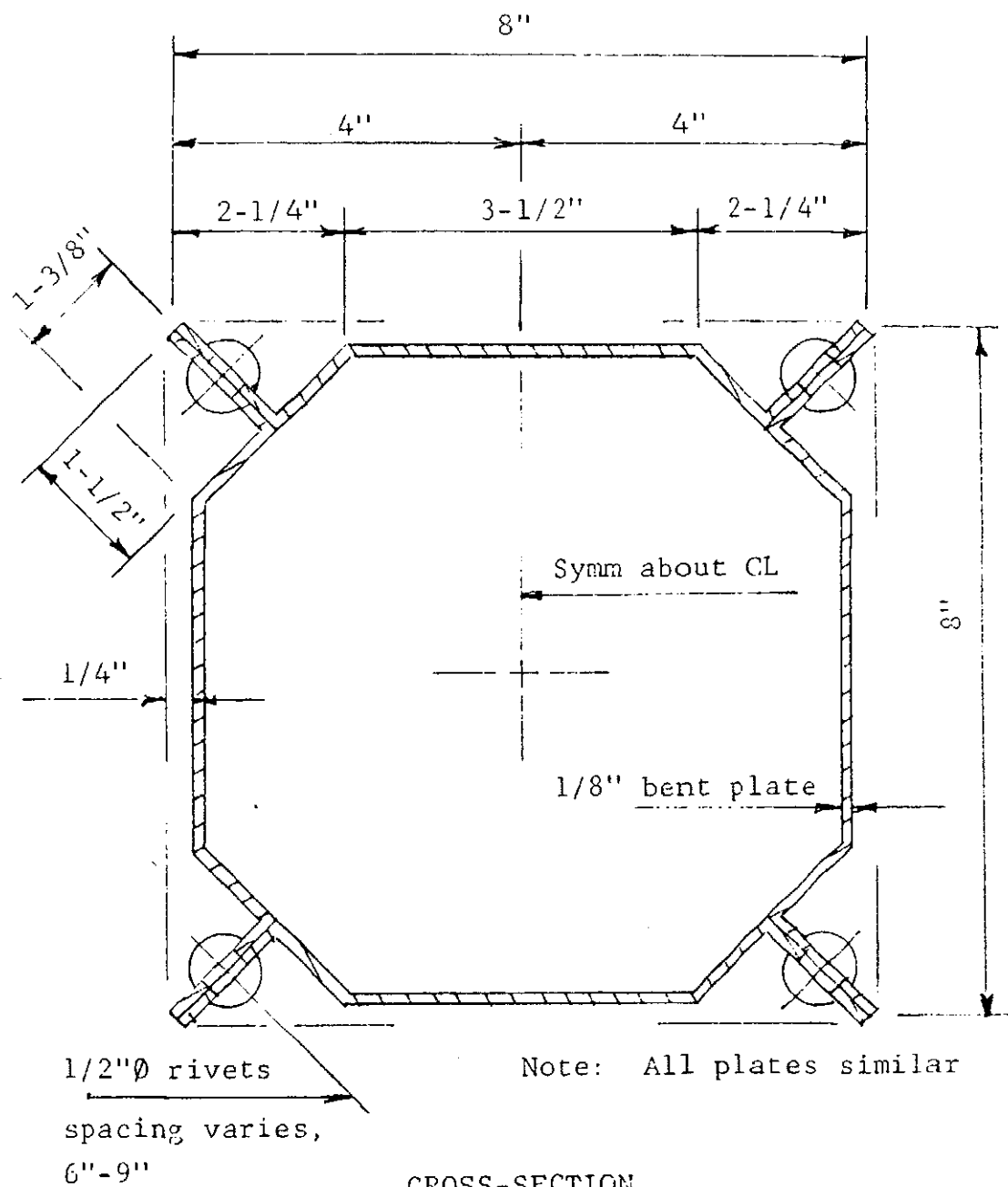
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CROSS-SECTION
ARCH CHORD

Figure 1